CALIFORNIA SOLAR ENERGY INDUSTRIES ASSOCIATION
916-747-6987 info@calseia.org
P.O. Box 782, Rio Vista, CA 94571

June 14, 2010

Marina Salinas (mas@cpuc.ca.gov)
Honesto Gatchalian (jnj@cpuc.ca.gov)
Energy Division
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

Sid Newsom (snewsom@SempraUtilities.com)
Tariff Manager - GT14D6
555 West Fifth Street
Los Angeles, CA 90013-1011

Re: Protest of CALIFORNIA SOLAR ENERGY INDUSTRIES ASSOCIATION to Advice Letters (AL) 4115, AL 3673-E/3119-G, 2475-E, and AL 12

Dear Ms. Salinas, Mr. Gatchalian and Mr. Newsom,

The California Solar Energy Industries Association (CALSEIA) submits this protest to AL-4115, AL 3673-E/3119-G, 2475-E, and AL 12. Below are comments on the CSI Thermal Handbook attached to these advice letter.

1. Section 3.3.2 50/50 Rebate Payment True-Up

CALSEIA is strongly opposed to the Handbook provision which would hold back half of the rebate for all commercial solar rebate applications for one year. This particular provision is harmful to small businesses who participate in this program and creates unnecessary increased costs to those businesses. As has been standard practice in the California Solar Initiative (CSI) for photovoltaic systems, it is typical for customers to expect the contractors to receive the rebate payment. Contractors in the CSI program have long suffered due to lengthy delays in rebate payments and been forced to borrow and pay interest in order to cover their operating expenses while awaiting rebate payments. During these hard financial times many reasons for strain on the economy has been small businesses lack of access in capital. Financing constraints will limit competition to only large and well backed contractors. The lack of competition will drive costs up instead of down.

The true-up proposed in the Handbook will not work in many typical Solar Water Heating (SWH) applications, such as:

a. NEW CONSTRUCTION. New buildings are often delayed in reaching full occupancy capacity and the results of metering the first year will likely be drastically less than the subsequent 25 years.

b. AFFORDABLE HOUSING. One of the most compelling markets for SWH technology is affordable housing. The nature of affordable housing projects requires that all of the financing for the construction be in place prior to work beginning. If grant funded, they will need to show project completion and will not be able to wait a calendar year for final system data. As a result, SWH will be less of a priority for developers because of the lack of rebate assurance and complication of financing to cover the 50/50 process.
c. EXISTING BUILDING STOCK. Capitalization for retrofit projects is more difficult than for new construction. Funding for retrofit projects comes from cash reserves and delays in the rebate will limit the financial ability to build a properly sized solar thermal system.

To help illustrate what is a likely outcome if the Commission allows the 50/50 rebate rule to take effect, CALSEIA provides this scenario of a fully functioning system under the 50/50 rebate affecting SWH market:

> *A customer retains a contractor to install a system on a new affordable housing development in Oakland. The contractor charges $100,000 for a 16 collector system on a 50 unit development and submits a rebate application for of $25,000. The $12,500 upfront rebate is given to the developer and 70% of that rebate amount goes to pay for the PPD provider and monitoring equipment. The customer decides to carry the rebate and puts $12,500 into their budget for first year cash inflows. It takes approximately six months for the building to get up to full occupancy; the first four months (June, July, August, September) there was only 20% occupancy and gas boilers rarely turned on. In addition, the following spring was unusually rainy. The end result is that during peak production time the load was well below standard operation and the therms offset of the system, for the first year, was half of what was expected. The PA decides to not pay any additional rebate to the developer. This puts financial strain on the building management company and they charge additional fees to the already strapped tenants to cover their short fall. The developer is burned by the experience and for all subsequent projects and decides solar thermal causes more trouble than it is worth. If the solar company had covered the rebate a loss of this amount could put huge financial strain on the contractor's business.*

The 50/50 true up proposed in the Handbook would institutionalize a year-long delay in rebate payments. Worse, the 50-50 true-up proposed in the Handbook implies that the Program Administrators lack confidence in their ability to review applications and determine their correctness. The CSI Thermal program includes several review steps to ensure that projects are sized and installed correctly prior to rebate applications:

- Application review
- Physical on-site inspection
- Incentive Claim Form review

It is reasonable to assume that at one of those reviews, the Program Administrators would be able to identify and modify a rebate request or request justification if a Program Administrator found that the performance estimate in the rebate calculator exceeded the performance of the actual installed system.

CALSEIA agrees the Commission should identify a method to address concerns that the performance calculator cannot detect inaccurate hot water loads and that there should be a means to ensure that rebate applications do not request excessive rebates.[1] But the 50/50 true-up is NOT the way to accomplish this. CALSEIA proposes the following alternative to the 50-50 true-up:

- Eliminate the true-up requirement and require a standard hot water load assumptions for performance calculations that all projects must use for estimating daily hot water demand and allow deviations only based on measured data. CALSEIA suggests using the hot water load guideline (Table 1) attached to this protest. Projects that are not listed specifically in the sizing guideline should be required to submit data (either utility billing data or metered hot water usage). For systems larger than 200kWth, a performance calculation by a registered California Professional Engineer.
- Authorize Program Administrators to use Marketing Funds to retain a Professional Engineer to review applications on an as-needed basis.
- Strengthen audit powers and penalties to prevent fraud.

If further restrictions are still necessary, then CALSEIA suggests that a rebate hold back be limited to only those commercial systems that larger than 250kWth and reducing the hold-back to 10% of the rebate (i.e., 90/10) and reduce the hold-back period from 12 months to 3 months.

2. Section 4.4.3 Reservation period 12 month reservation period w/180 calendar extension

CALSEIA recommends increasing the reservation period from 12 months to 18 months with an extension up to 180 calendar days. This will not only maintain consistency throughout CSI programs but create a more realistic timeframe to complete >30kWth Commercial/Multi-Family projects, and will relieve the administrative burden on Program Administrators of processing extensions.

3. Section 4.7.1 Reservation Request Form

This section states that the reservation request form be signed by the applicant, host customer, and system owner prior to the SWH system being installed. This eliminates retroactive projects that are specifically allowed beginning July 16, 2009. CALSEIA requests that this section clarify that the signature requirements prior to installation are not applicable to projects that were installed after July 16, 2009 but before the Handbook was approved.

4. Section 6.4.1.1 Flow meter

The Handbook requires electro-magnetic flow meters with an accuracy of +/- 0.4% for commercial solar thermal installations. Industry uses vortex flow meters with an accuracy of +/- 1.5% at full scale (at its normal operational flow rate the Vortex accuracy is actually at 0.4 or better). As written, the metering requirement will result in increased cost compared to alternative cost effective and readily available, reliable products like the Vortex Principle. The electro-magnetic flow sensors are significantly more expensive products and have higher installation costs. The purpose of the monitoring is primarily to

[1] Since no evidence of fraud was shown during the San Diego pilot program data provided by ITRON, there is no basis to excessively limit the rebate payments.

verify that the system is operating to specs not to build an on-site test lab. CALSEIA respectfully requests the accuracy requirement be modified to allow an accuracy of +/- 2% to ensure that existing turbine, vortex, positive displacement technologies are allowed.

5. Section 6.4 Minimum Metering Equipment Requirements

The proposed monitoring and metering requirements for systems >30 kWth do not achieve CSI Thermal's goals of reducing costs and barriers to the adoption of solar thermal technologies and is inconsistent with statute which requires "monitoring and measurement of the system's performance and the quantity of energy generated or displaced by the system."[2] What has been proposed in the Handbook is a method to determine hot water usage in a building – but it does not measure the performance of the SWH system. CALSEIA recommends that the performance monitoring be revised to monitor the performance of the system.

Load-side monitoring is unrealistically expensive, unpredictable and inaccurate, and does not provide the customer with production information that would show whether their system is functioning. With load-side monitoring, the actual conditions of the solar system are not known, hindering the customer from getting system maintenance if needed. If there is a drop in performance, the drop can be due to a drop in demand, bad weather, *or* system malfunction, and there will be no data to tell the owner what is happening in the solar system.

At the stakeholder meeting, the industry consensus was that monitoring on the closed-loop side for systems >30 kWth was the only practical and helpful method. Most manufacturers already provide functional monitoring systems that are inexpensive, more reliable, accurate within common guidelines, and they all have flow meter placement on the solar side of the loop. A solar side monitoring requirement would better achieve the program goals of increasing adoption rate, reducing cost of SWH systems and increasing customer understand of SWH technology.

[2] Public Utilities Code 2864(a)(5)

CALSEIA investigated the cost of the monitoring system proposed in the Handbook and found that for even a smaller system, the initial cost would be approximately $7,000 for the monitoring system only (see Table below):

Flow meter	Onicon F3100 1 ¼"	$2500
150# flanges	Special order Lead Free Brass/Stainless steel	$125
Btu Meter	Onicon LCD display	$1100
Data translator	Fat Spaniel	$750
Gateway	Fat Spaniel	$600
PPD	Fat Spaniel	$825-1500 per year
Installation	Plumber $85/hr. 6 hrs	$510
Installation	Electrician $74/hr 2 hrs.	$148
IT/commissioning troubleshooting	$120/hr min. 2 hrs up to 10 if problems persist	$240 to $1200
Total upfront costs[3]	**1 year service**	**$6798 minimum**
Warranty/service costs for 10 years PPD	estimated	$450
Annual PPD service charge for 10 years of required monitoring	Fat Spaniel $825/year	$7425
Total charges for monitoring/PPD	**10 years**	**$14,673**

CALSEIA strongly recommends that the program establish rational performance monitoring requirements. Monitoring is a requirement and we support that because it will benefit the customers and ensure that ratepayer funds are expended prudently. However, the monitoring requirements proposed in the Handbook are excessive. Therefore, CALSEIA recommends:

- Load side monitoring should be reserved for CSI Thermal Measurement and Evaluation only. Solar-side monitoring should be required for all systems 30kWth and larger (as required by statute).

6. Section 6.4.1.2 Temperature Sensors

The Handbook requires semiconductor-based electronic temperature sensors with an accuracy of +/- 0.15F. It is standard industry practice to use Thermistor Temperature sensors with an accuracy of +/- 0.25F. The Thermistor type sensors are more typical industry practice. There is no explanation provided for this requirement, therefore CALSEIA recommends that both types of sensors be allowed.

[3] PPD provider costs are not known. $825/ year is standard non-utility grade monitoring services with no on-site support provided. Costs for PPD provisions are expected to be greater than $825.

7. Table 7

Appendix D is NOT Table 7 of the ASHRAE handbook (please see attached copy of ASHRAE Table 7). CALSEIA suggests that the Table shown Appendix D be revised to conform with the referenced ASHRAE document.

8. Section 6.1.5 Air Collectors

CALSEIA appreciates the clarification that air collectors may use open loop configurations, however, we believe the word "conditioned" was inadvertently used in this section. CALSEIA recommends that the word "enclosed spaces" be used instead of "conditioned" to allow open loop air collector systems that place the plumbing and mechanical equipment in unconditioned spaces (such as attics):

> "Air collectors do not require freeze protection. Non-coupled water circulation systems maintained in ~~conditioned~~ *an enclosed* space do not require freeze-protection and may be open-loop. If the water piping of the circulation system is exposed to the environment, automatic freeze protection for the piping is required."

CALSEIA respectfully requests that the Advice Letter be revised to incorporate the modifications requested above.

Thank you in advance for your consideration.

Sincerely,

Sue Kateley

Sue Kateley
Executive Director

cc: R.08-03-008 Service List

Table 1: CalSEIA Recommended Guideline for determining Hot Water Loads for sizing Commercial SHW systems

Note: These assumptions are for rebate calculations only and should not be used for doing actual system design and sizing.

Apartments:

- Without on-site laundries**:** 20 GPD per apartment of 120 F set temperature water
- With on-site laundries: 25 GPD per apartment at 120 F set temperature

Student Housing: 15 GPD per unit at 120 F set temperature

Hotels/Motels: 15 GPD per room at 125 F set temperature water

Retirement Homes: 18 GPD per room at 120 F set temperature per room

Laundries: 20 gals/10 lb. per washing machine at 130 F set temperature water

Restaurants

- Meal Service Restaurants: 24 GPD at 140 F set temperature water per 10 full meals served
- Quick Service Restaurants: 0.7 gallons per meal at 140, average of 500 gallons per day.

Office Buildings (without showers): 1 GPD per occupant at 120 F set temperature water. Occupant estimate must conform to building occupancy rating.

Projects not listed or with demand assumptions greater than listed above:

- Rebate applicants shall meter on-site hot water demand for a minimum of 4 weeks and provide an analysis of system sizing by a registered professional engineer.

- A load verification on new construction can be made as part of the inspection (with an ultrasonic meter). Permanent cold side monitoring, is not helpful or needed in order to verify system function. Cold side monitoring only verifies demand.

- Load verification of existing buildings can be determined and stamped by a Professional Engineer or if requested by a third party.

Table 7 Hot-Water Demands and Use for Various Types of Buildings*

Type of Building	Maximum Hourly	Maximum Daily	Average Daily
Men's dormitories	3.8 gal/student	22.0 gal/student	13.1 gal/student
Women's dormitories	5.0 gal/student	26.5 gal/student	12.3 gal/student
Motels: Number of units[a]			
20 or less	6.0 gal/unit	35.0 gal/unit	20.0 gal/unit
60	5.0 gal/unit	25.0 gal/unit	14.0 gal/unit
100 or more	4.0 gal/unit	15.0 gal/unit	10.0 gal/unit
Nursing homes	4.5 gal/bed	30.0 gal/bed	18.4 gal/bed
Office buildings	0.4 gal/person	2.0 gal/person	1.0 gal/person
Food service establishments			
Type A: Full-meal restaurants and cafeterias	1.5 gal/max meals/h	11.0 gal/max meals/day	2.4 gal/average meals/day[b]
Type B: Drive-ins, grills, luncheonettes, sandwich, and snack shops	0.7 gal/max meals/h	6.0 gal/max meals/day	0.7 gal/average meals/day[b]
Apartment houses: Number of apartments			
20 or less	12.0 gal/apartment	80.0 gal/apartment	42.0 gal/apartment
50	10.0 gal/apartment	73.0 gal/apartment	40.0 gal/apartment
75	8.5 gal/apartment	66.0 gal/apartment	38.0 gal/apartment
100	7.0 gal/apartment	60.0 gal/apartment	37.0 gal/apartment
200 or more	5.0 gal/apartment	50.0 gal/apartment	35.0 gal/apartment
Elementary schools	0.6 gal/student	1.5 gal/student	0.6 gal/student[b]
Junior and senior high schools	1.0 gal/student	3.6 gal/student	1.8 gal/student[b]

*Data predate modern low-flow fixtures and appliances. [a]Interpolate for intermediate values. [b]Per day of operation.

Additional Data.

Fast Food Restaurants. Hot water is used for food preparation, cleanup, and rest rooms. Dish washing is usually not a significant load. In most facilities, peak usage occurs during the cleanup period, typically soon after opening and immediately before closing. Hot-water consumption varies significantly among individual facilities. Fast food restaurants typically consume 250 to 500 gal per day (EPRI 1994).

Supermarkets. The trend in supermarket design is to incorporate food preparation and food service functions, substantially increasing the usage of hot water. Peak usage is usually associated with cleanup periods, often at night, with a total consumption of 300 to 1000 gal per day (EPRI 1994).

Apartments. Table 8 shows cumulative hot-water use over time for apartment buildings, taken from a series of field tests by Becker et al. (1991), Goldner (1994a, 1994b), Goldner and Price (1999), and Thrasher and DeWerth (1994). These data include use diversity information, and enable use of modern water-heating equipment sizing methods for this building type, making it easy to understand the variety of heating rate and storage volume combinations that can serve a given load profile (see Example 1). Unlike Table 7, Table 8 presents low/medium/high (LMH) guidelines rather than specific singular volumes, and gives better time resolution of peak hot-water use information. The same information is shown graphically in Figure 15.

The low-use peak hot-water consumption profile represents the lowest peak profile seen in the tests, and is generally associated with apartment buildings having mostly a mix of the following occupant demographics:

- All occupants working
- One person working, while one stays at home
- Seniors
- Couples
- Middle income
- Higher population density

The medium-use peak hot-water consumption profile represents the overall average highest peak profile seen in the tests, and is generally associated with apartment buildings having mostly a mix of the following occupant demographics:

- Families
- Singles
- On public assistance
- Single-parent households

The high-use peak hot-water consumption profile represents the highest peak profile seen in the tests, and is generally associated with apartment buildings having mostly a mix of the following occupant demographics:

- High percentage of children
- Low income
- On public assistance
- No occupants working
- Families

Table 8 Hot-Water Demand and Use Guidelines for Apartment Buildings (Gallons per Person at 120°F Delivered to Fixtures)

	Peak Minutes						Maximum	Average
Guideline	5	15	30	60	120	180	Daily	Daily
Low	0.4	1.0	1.7	2.8	4.5	6.1	20	14
Medium	0.7	1.7	2.9	4.8	8.0	11.0	49	30
High	1.2	3.0	5.1	8.5	14.5	19.0	90	54

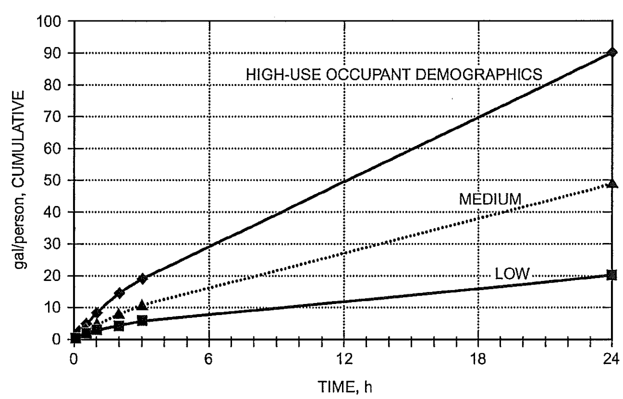

Fig. 15 Apartment Building Cumulative Hot-Water Use Versus Time (from Table 8)